Space Weather Forecast

Issued on Wednesday, 17 May 2023 at 13:24 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: A relatively quiet solar wind through the period, perhaps enhancing later. Running chance of moderate-class solar flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been High over the last 24 hours, with the largest event a significant Moderate-class flare (M9.6), which was observed at 16/1643 UTC, originating from a sunspot region which is now just emerging onto the Earth-facing disc. Otherwise, flare activity has been mainly confined to minor common-class flares. There are currently seven sunspot regions on the visible disc, two of which are large and fairly complex. There have been two CMEs observed in the last 24 hours, but one is directed away from the Earth (backwards off the Sun) and the one associated with the M9.6 flare is also not expected to be Earth-directed. A number of filaments are present on the disc, some of them showing signs of instability (which could lead to a CME).

Solar Wind / Geomagnetic Activity: The solar wind speed has been at slightly elevated levels throughout, but on a gradual decline through the last 24 hours. The magnetic properties of the wind have not been favourable for geomagnetic activity, hence the overall geomagnetic activity has been mainly quiet (Kp1-2).

Energetic Particles / Solar Radiation: No solar radiation storms were observed, although the radiation is slightly elevated above background yesterday afternoon. Levels have since stabilised and remain well below S1 threshold.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity will be mainly Low (C-class), but with a chance of isolated Moderate (M-Class) flares, these most likely caused by the new large region which is currently rotating into view around the southeast limb which has a history of high M-flares.

Solar Wind / Geomagnetic Activity: Solar winds are expected to be near ambient for the most part, with no CMEs or coronal hole fast winds until maybe days 3 and 4 (19th and 20th May) when the wind is likely to pick up a little, offering a higher chance of Unsettled to Active periods (Kp3-4).

Energetic Particles / Solar Radiation: No solar radiation storms are expected although may remain slightly elevated for the next couple of days, well below S1 threshold assuming no further large flares occur.

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Met Office Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	10	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	50	50	50	50
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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